



**OUTSTANDING CIVIL TYPES :** The De Havilland Hornet Moth (130 h.p Gipsy Major) side-by-side two-seater.

renewed interest in the real light aeroplane—as exemplified by the B.A.C. Drone, the Aeronca, and the *Pou du Ciel*—conclusively proves that the interest in flying as a pastime grows more pronounced.

Nevertheless, the number of private owners remains a virtually stationary figure. Aeroplanes, in a country where the weather is so very fickle, are still limited in usefulness, though not in "pleasurefulness," and the keen amateur often prefers to do his flying without the necessity for incurring the responsibilities of ownership. By way of encouraging the impecunious, the Air League started a fund scheme for young pilots during the year, and several clubs have followed this example with somewhat similar schemes. In America the Bureau of Air Commerce has been endeavouring to stimulate private flying, and has encouraged the design of a number of easy-to-fly types.

Matters have comfortably settled down in the gliding world, and the few active clubs have been doing considerably more flying. There has been the added inducement offered by the Government subsidy, the terms for the distribution of which caused so much anxiety. During the National Gliding Competitions at Sutton Bank some 130 hours were flown, and this figure was half again as much as that registered during the 1934 event.

## MODERN TENDENCIES IN DESIGN

AS was to be expected, the year which has just closed did not bring forth any very startling innovations in fundamental aircraft design. If, in spite of this fact, performances generally were improved and the efficiency increased, this was due to detail refinements rather than to fundamental changes in design.

Retractable or trousered undercarriages may now be said to have become almost standard equipment except on military biplanes, and the reduction or total suppression of the drag of this necessary evil has contributed greatly to the extra efficiency. Trailing edge flaps have made possible an increase in wing loading without sacrifice in landing speed, and cruising speed, range, and pay load have all

benefited from the introduction of this modern aid to efficiency. The controllable-pitch airscrew has not yet come into extensive use in this country, but its advantages on aircraft types which have a wide speed-range are now fully understood, and there is little doubt that during 1936 a considerable number of aircraft will be fitted with this aeronautical equivalent of the motor car gear box.

Closely associated with the growing popularity of the low-drag undercarriage has been the almost universal adoption of the low-wing type of monoplane for the smaller classes of civil aircraft. The distance from wing to ground is a minimum, so that a "trousered" or "spatted" undercarriage is kept to minimum length, while even the retractable undercarriage benefits from the shorter struts.

In military aviation the monoplane has made considerable headway against the time-honoured biplane, and several of the new types which will make their appearance in 1936 will be of the monoplane type. While benefiting from low wings, retractable or trousered undercarriages, and trailing edge flaps, military aircraft of the biplane type have also shown a marked improvement in performance. This is almost entirely due to the introduction of fuel of 87 Octane value, which has made possible a much higher compression ratio, increased power output without increase in external engine size, and a reduced fuel consumption. There are many who hold the view that 1936 is almost certain to see the general adoption for military aircraft of 100-Octane fuels.

## The Diesel Position

One result of the great advance made in the design of petrol engines and their fuels has been to push the diesel engine out of the picture as far as aviation is concerned. The very low specific weight of the modern petrol aero engine, coupled with a remarkably low fuel consumption, has made it impossible for the diesel to compete except for flights of much greater duration than normally undertaken by either military or commercial aircraft. That is not to say that work on developing the diesel should be dropped entirely, but it does mean that the cost of undertaking such work, with the leeway to be made up, is beyond the ability of private enterprise, and must, if it is to be done at all, become largely a Government responsibility.

From a structural point of view, the past year indicated two strong tendencies: the use of wood for small civil and commercial aircraft types, and smooth metal skin covering for large civil and military aircraft. The latter form of construction, although used with success by flying boat designers for many years, is something of an unknown quantity when applied to fuselages and, particularly, wings, and it will be very interesting to see how the different designers solve their problems. When, some ten or twelve years ago, the Air Ministry decided that military aircraft would in future have to be of all-metal construction, nearly every firm in the country set to work to evolve its own type of construction. Something of the sort seems likely to happen again while changing over to metal-clad or "stressed skin" construction, many of the problems of which are even more difficult in their way than were those of metal girder construction when that began.

## PRINCIPAL WORLD'S RECORDS HOMOLOGATED UP TO OCTOBER 1, 1935

Record and Country.*	Pilot(s).	Machine.	Engine.	Date.	Place.	Record Figures.
<b>AEROPLANES</b>						
Speed (F.) ...	R. Delmotte ...	Caudron ...	380 Renault ...	25/12/34	Istres ...	314.321 m.p.h. (505.848 km/h).
Distance (F.) ...	Rossi and Codos ...	Bleriot ...	550 Hispano ...	5-7/8/33	U.S.A.-Syria ...	5,657.4 miles (9 104,700 km).
Altitude (I.) ...	R. Donati ...	Caproni ...	600 "Pegasus" ...	11/4/34	Rome ...	47,352.6 ft. (14 435 m).
<b>SEAPLANES</b>						
Speed (I.) ...	F. Agello ...	Macchi M72 ...	Fiat ...	23/10/34	Desenzano ...	440.68 m.p.h. (709.209 km/h).
Distance (I.) ...	Stoppani and Corrado ...	Cant. Z.501 ...	750 I.F. ...	16-17/7/35	Monfalcone-Berbera ...	3,063.2 miles (4 929,697 km).
Altitude (A.) ...	A. Soucek ...	Wright "Apache" ...	425 P. & W. ...	4/6/29	Washington ...	38,500 ft. (11 753 m).
<b>BALLOONS</b>						
Duration (G.) ...	H. Kaulen ...	Balloon of more than 4 000 m <sup>3</sup> ...	... ..	12-17/12/13	—	87 hours.
Distance (G.) ...	Berliner ...	" " " " " " ...	" " " " " " ...	8-10/2/14	—	1,897 miles (3 055.7 km).
Altitude (A.) ...	Settle and Fordney ...	" " " " " " ...	" " " " " " ...	20/11/33	Arton ...	61,237 ft. (18 666 m).

\* Abbreviations for countries: A, America; G, Germany; F, France; I, Italy.